

MEMORANDUM

DATE: November 9, 2000

TO: Division of Shellfish Sanitation Staff

FROM: Robert E. Croonenberghs, Ph.D., Director
Division of Shellfish Sanitation

THROUGH: Robert W. Hicks, Acting Director
Office of Water Programs

SUBJECT: Seawater Sampling - Procedure - Phytoplankton Sampling Program

DELETE WORKING MEMO # S-284

Purpose

The objectives of this protocol are:

1. To establish the conditions under which routine sampling for cold weather harmful algal blooms should be initiated.
2. To establish the effective dates of this protocol, which are November 1 through April 30 each year until terminated.
3. To establish a uniform methodology for the collection of seawater and samples during cold water conditions to monitor specific phytoplankton populations that are **not involved in a fish kill**.

Introduction

The Division is refining its biotoxin monitoring program with respect to the potential for cold water toxic algae species in Virginia waters. We are working with Dr. Harold Marshall, at Old Dominion University, in our toxic algae monitoring effort. Dr. Marshall analyzes our red tide bloom samples for the presence of potentially toxic species and our routine warm water phytoplankton samples for the presence of *Pfiesteria* complex organisms (PCO).

The Division is required under the NSSP to have a contingency plan in place should harmful algal blooms occur in shellfish growing areas. This working memo establishes the contingency plan for the months of November through April, when the likelihood of harmful algal blooms is reduced, and only a minimal number of cold water species might be of concern. Our routine PCO sampling collected during the warm weather months provides extensive monitoring and is our contingency plan for those months.

Cold Water Phytoplankton Sampling Contingency Plan

1. The purpose of this sampling procedure is to provide information on a specific algal species of concern in shellfish growing areas during the cold weather months starting November 1 and ending April 30. Once the concern abates, sampling will be discontinued.
2. During the months of November through April, the Division will not routinely collect phytoplankton samples. Instead, we will rely upon the Department of Environmental Quality's (DEQ) Chesapeake Bay monitoring data. Dr. Harold Marshall analyzes these samples, so he is in a unique position to notify us should concentrations of species of concern increase in the Bay during the cold weather months.
3. Conditions which trigger cold water phytoplankton sampling
The Division will initiate intensive sampling according to this memo should concern arise at a minimum from any of the following three sources:
 - Data collected from our red tide bloom sampling during these cold months as indicated in WM # S-244.
 - Data from the DEQ Chesapeake Bay monitoring data
 - Concern expressed by Dr. Harold Marshall or other qualified phycologists
4. Phytoplankton Sampling Design
 - a. Sampling conducted under this procedure is to be done in addition to any special sampling that might be done for red tide blooms (WM # S-244). If you see a red tide bloom, take samples in the bloom and a sample from the station indicated in this working memo, Dr. Marshall is very interested in these blooms.
 - b. Generally, ten phytoplankton samples shall be taken from each of the DSS field office areas each month. The sampling locations are shown on the attached station list, which may be modified slightly from time to time.
 - c. Samples should be delivered to Dr. Marshall, generally at a maximum of every month. Choice of the best delivery times is up to the field director.

Phytoplankton Sampling Procedure

1. Use the Kemmerer bottle to collect a mid-depth sample. Measure depth of water and then sample at the mid point. Kemmerer bottle rope should be marked the same as the Secchi disk rope (in whole units and tenths of meters). Decant from the Kemmerer bottle to the pint size (473 ml) Nalgene sampling bottles and store the samples. Label the bottles, when dry, with a Sharpie Brand (black is best) permanent marker as: DSS Phytoplankton Sample; growing area number; station number; date; water temperature, sample depth (meters to the nearest tenth), salinity, dissolved oxygen (DO) and Secchi depth.
2. Temperature, salinity, dissolved oxygen (DO) and Secchi depth shall be measured at the phytoplankton sampling sites. If a DO probe is not available, be sure to measure temperature and salinity.
 - Measure at the same depth as the water sample (mid-depth)
 - Any zero DO readings should be confirmed by bringing the probe back to the surface and checking to be sure it is not covered with sediment, then carefully lowering back into the water.
 - DO readings are a key differentiator between unusual fish activity situations where there is sufficient oxygen for fish respiration and where there is not enough - be careful as this data may be widely and critically cited.
3. Sample at **mid-depth** for the sample station.
4. Add enough Lugol=s solution to turn the water sample a medium amber color after swirling the sample.
 - The amount needed will vary depending on the strength of the Lugol=s solution.
 - Lugol=s solution can be added to the sample container prior to leaving the office once you learn how much is needed for the strength of Lugol=s mixture you use.
5. Samples should be protected from high heat and extended bright light. These preserved water samples (as opposed to unpreserved phytoplankton water samples collected for blooms) may be transported on ice and stored in refrigeration. Protection from bright sunlight is the major concern here.

Phytoplankton and Sediment Sampling Sites

<u>Area</u>	<u>Site</u>	<u>Station Number</u>
2	Monroe Bay	13
4	Nomini River, Currioman Bay	10
8	Coan River, Glebe Creek	14
10	Little Wicomico River	13
12	Cockrell Creek	6
13	Great Wicomico River	23
14a	Mill Creek, Dividing Creek	6
21	Corrotoman River	37
25u	Rappahannock River	20
39	Horn Harbor	5
41	East River	1
43	Ware River	16
46	Sarah Creek	2.5
48	York River: Purtan Bay	17
49	York River: West Point	201
53	Poquoson River, Back Creek	59
55	Chesapeake Bay: Back River to Old Point Comfort	B18
58	Warwick River	6
61	Pagan River	6
68	Little Creek	CC0
70	Lynnhaven River	17
71	Broad Bay	4
75	Pocomoke Sound	J8
77	Hunting and Deep Creeks	6
78	Tangier	6
80	Onancock Creek	3
84	Occohannock Creek	6
85	Nassawadox Creek	1
86	Hungar and Mattawoman Creeks	1
88	Cherrystone Inlet	5
92	Fisherman=s Island	3
93	Seaside	9
99	Bogues and Shell Bays	5